PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. II. AUGUST, SEPT. & OCT., 1842. No. 23.

Stated Meeting, August 19.

Present, twenty-seven members.

Mr. DU PONCEAU, President, in the Chair.

Mr. Fraley, a member elect, was presented to the President, and signed the laws.

Letters were read:—

From the Baron de Ladoucette, dated Paris, 19th March, 1842, acknowledging the honour of his election as a member:—

From the Baron de Ladoucette, dated Paris, 5th May, 1842, Count Gråberg de Hemsö, dated Florence, 30th May, 1842,—the Hon. J. R. Ingersoll, dated Washington 13th July, 1842, and the Dutch Society of Sciences at Harlem, dated 28th July, 1842, severally announcing the transmission of donations to the Library:—

From Dr. Harlan, dated 19th Aug. 1842, announcing the return of the fossil bones of the Megalonyx, borrowed by him from the Society some time since, and requesting that his paper on the Orycterotherium Missouriense might be returned to him:—and

From Mr. Picot, consul of France, dated 19th Aug. 1842, inviting the Society to attend the funeral services in honour of H. R. H. the late Duke of Orleans, on the 26th instant.

On motion, the request contained in Dr. Harlan's letter was granted.

The invitation to attend the funeral services in honour of the Duke of Orleans was accepted.

The following donations were announced:

FOR THE LIBRARY.

Catalogue of the Officers and Students in Yale College, 1841–2. 8vo. New Haven, 1841.—*From the College.*

Quarterly Summary of the Transactions of the College of Physicians of Philadelphia, for May, June and July, 1842. Vol. I. No. 3. 8vo. Philadelphia, 1842.—*From the College.*

The American Medical Library and Intelligencer. By Robley Dunglison, M.D. New Series. Vol. I. No. 12. For June, 1842. 8vo. Philadelphia, 1842.—*From the Editor.*

Ueber die Himjaritische Sprache und Schrift von Dr. Wilhelm Gesenius. 8vo. 1841.—*From the Author.*

Address delivered by B. A. Bidlack, on the 22d Feb. 1839, at Wilkesbarre, Penn. 8vo. Washington, 1842.—*From the Author.*

Statistics of the United States of America. Collected under the Thirteenth Section of the Act for taking the Sixth Census. Published by Authority. Folio. Washington, 1841.—*From the Hon. J. R. Ingersoll.*

Bulletin de la Société de Géographie. Second Series. Vol. XVI. 8vo. Paris, 1841.—*From the Society.*

Journal de Pharmacie et de Chimie. New Series. Vol. I. Nos. 2, 3, 4 & 5. 8vo. Paris, 1842.—*From the Editors.*

Annales des Mines. Third Series. Vol. XX. No. 5. 8vo. Paris, 1841.—*From the Council of Mines.*

Journal Asiatique, ou Recueil de Mémoires, d'Extraits et de Notices relatifs à l'Histoire, à la Philosophie, etc. Third Series. Vol. XII. No. 69, and Vol. XIII. Nos. 70 & 71. 8vo. Paris, 1841–42.—*From the Society.*

Fables de J. C. F. Ladoucette. Seconde Édition. 8vo. (Two copies.) Paris, 1842.—*From the Author.*

Notice sur la Vie et sur les Travaux de M. le Baron de Ladoucette, député de la Moselle. 8vo. Paris, 1842.—*From the Baron de Ladoucette.*

Recueil des Travaux de la Société d'Amateurs des Sciences, de l'Agriculture et des Arts, à Lille. Années 1819, 1820, 1821, 1822, 1823, 1824, 1825, 1826, et 1er Semestre de 1827. Four volumes. 8vo. Lille.—*From the Society.*

Séances Publiques de la Société d'Amateurs des Sciences et des Arts,

à Lille. No. 4, 1811, & No. 5, 1819. 8vo. Lille.—*From the Society.*

Mémoires de la Société Royale des Sciences, de l'Agriculture et des Arts, à Lille. 2e Semestre de 1827, et Années 1828, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1840, et 1841. Fourteen volumes. 8vo. Lille.—*From the Society.*

Observations Authentiques sur la Peste du Levant, et sur la Vertu spécifique de l'Huile d'Olive contre cette effrayante Maladie. Par J. Grâberg de Hemsö. 8vo. Florence, 1841.—*From the Author.*

Notice sur la Race de Dromadaires existant dans le Domaine de San Rossore, près de Pise en Toscane. Par Jacques Grâberg de Hemsö. 8vo. Paris, 1840.—*From the Author.*

Degli Ultimi Progressi della Geografia Sunto Letto pel Conte Cavaliere Jacopo Grâberg da Hemsö, Dottore di Filosofia e Belle Lettere, &c. 8vo. Milan. 1841.—*From the Author.*

Relazioni Commerciali dell'Egitto dell'Isola di Candia, e della Siria coi Porti dell'Italia e principalmente con quello di Livorno. 8vo. Florence, 1841.—*From Count Graberg de Hemsö.*

Sunto della Litteratura Svezzese in questi Ultimi Anni cioè fino all' Epoca, del Viaggio del Sig. Marmier gia'dettato nell'anno 1833, ma ora reveduto, corretto, e formito di giunte dal Conte Cav. Dottore Jacopo Grâberg da Hemsö. 8vo. Florence, 1841.—*From the Author.*

The Ninth Annual Report of the Royal Cornwall Polytechnic Society. 8vo. Falmouth, 1841.—*From the Society.*

Natuurkundige Verhandelingen van de Hollandsche Maatschappij der Wetenschappen te Haarlem. Vol. I. Part II. 4to. Harlem, 1841.—*From the Society.*

Journal of the Franklin Institute. Third Series. Vol. IV. No. 2. 8vo. Philadelphia, 1842.—*From Dr. Patterson.*

Principles of General and Comparative Physiology. By William B. Carpenter, M.D. 8vo. London, 1841.—*From the Author.*

Principles of Human Physiology, with their chief Application to Pathology, Hygiène, and Forensic Medicine. By William B. Carpenter, M.D. 8vo. London, 1842.—*From the Author.*

Tic Douloureux, or Neuralgia Facialis, and other Nervous Affections; their Seat, Nature and Cause: with Cases illustrating successful Methods of Treatment. By R. H. Allnatt, M.D. 8vo. London, 1841.—*From the Author.*

Académie Royale des Sciences de Turin. Programme des Prix fon-

dés par M. le Comte Pillet-Will, associé correspondant de l'Académie. Turin.—*From the Academy.*

Accademia Reale delle Scienze di Torino. Classe delle Scienze Morali, Storiche e Filologiche, Programma. Turin.—*From the Academy.*

Public Documents (Senate). Second Session, Twenty-seventh Congress, No. 336. Invention for preventing Explosions of Steamboilers. Washington.—*From Prof. Walter R. Johnson.*

Notizie sulla Moltiplicazione in Firenze negli anni 1837, 1838, 1839, dell'Uccello Americano Paroaria Cucullata chiamato volgarmente Cardinale. Da Carlo Passerini. Folio. Florence, 1841.—*From the Author.*

Éloge Historique de M. Livingston. Par M. Mignet. Lu à l'Institut Royale de France, à la Séance publique du 30 Juin, 1838. 8vo. Paris, 1838.—*From Mr. Du Ponceau.*

FOR THE CABINET.

A Fac Simile of the engrossed Copy of the Declaration of Independence.—*From the Department of State, through the Hon. J. R. Ingersoll.*

Dr. Bache, Reporter, announced the publication of Nos. 21 and 22 of the Proceedings of the Society.

Dr. Patterson announced the death of Professor John Patton Emmet, of the University of Virginia, a member of the Society, on the 13th of Aug. 1842, aged 46 years, and gave a brief notice of his character and services.

The Committee on the Museum property presented the several papers and documents, necessary to carry into effect the purchase of the property, duly executed under the instructions of the Society, given at the last meeting.

On motion, it was resolved, that the Committee on the trust funds be charged with the duty of conferring with the Committee of Councils, in relation to the advance made by the city to a fund for constructing an Astronomical Observatory.

Stated Meeting, September 16.

Present, thirty-five members.

Mr. Du Ponceau, President, in the Chair.

Letters were read:—

From the Imperial Academy of Naturalists at Moscow, dated 8th May, 1842, and the Literary and Philosophical Society of Manchester, dated 24th May, 1842, announcing the transmission of donations to the Library:—

From the Prince of Canino, dated Florence, 29th July, 1842, referring to the meeting of sçavans to be held at Lucca in 1843, and to other matters of scientific interest.

The following donations were announced:—

FOR THE LIBRARY.

American Medical Library and Intelligencer. By Robley Dunglison, M.D. New Series. Vol. I. No. 13. Supplement. 8vo. Philadelphia, 1842.—*From the Editor.*

Memoirs of the Literary and Philosophical Society of Manchester. Second Series. Vol. VI. 8vo. London, 1842.—*From the Society.*

Twenty-fifth Annual Report of the London Provident Institution, to the 20th Nov. 1841. London.—*From William Vaughan, Esq.*

Classification of the Trades, Occupations, Business and Callings of the Depositors of the London Provident Institution. London.—*From the same.*

Proceedings of the Royal Astronomical Society. Vol. V. Nos. 23 & 24. 8vo. London, 1842.—*From the Society.*

Proceedings of the Royal Society of Edinburgh. Nos. 1 to 12 inclusive, and Nos. 19 & 20. 8vo. Edinburgh.—*From the Society.*

Transactions of the Royal Society of Edinburgh. Vol. XV. Part II. 4to. Edinburgh, 1842.—*From the Society.*

Philosophical Transactions of the Royal Society of London. For the Year 1842. Part I. 4to. London, 1842.—*From the Society.*

Proceedings of the Royal Society. Nos. 50, 51, 52 & 53. London, 1841–42.—*From the Society.*

Royal Society. Proceedings of the Committee of Physics, including Meteorology. Nos. 1, 2 & 3. London.—*From the Society.*

Catalogue of the Miscellaneous Literature in the Library of the Royal Society. 8vo. London, 1841.—*From the Society.*

An Address on the early Settlement of the Valley of Pequea. By Redmond Connyngham. Delivered at the Lyceum Celebration, 4th July, 1842, at Paradise.—*From the Author.*

Statistics of the United States of America, as collected under the Thirteenth Section of the Act for taking the Sixth Census. Published by Authority. Folio. Washington, 1841.—*From the Hon. G. W. Toland.*

Some Remarks on the Ancient Peruvians. By S. G. Morton, M.D. *From the Author.*

Remarks on the so called Pigmy Race of the Valley of the Mississippi. By S. G. Morton, M.D.—*From the Author.*

Description of some new Species of Organic Remains of the Cretaceous Group, &c. By S. G. Morton, M.D.—*From the Author.*

An Inquiry into the Distinctive Characteristics of the Aboriginal Race of America. Read at the Annual Meeting of the Boston Society of Natural History, April 27, 1842. By S. G. Morton, M.D. 8vo. Boston, 1842.—*From the Author.*

Catalogue of Skulls of Man and the Inferior Animals, in the Collection of S. G. Morton, M.D.—*From Dr. Morton.*

Description of some new Terrestrial and Fluviatile Shells of North America. By Thomas Say. 8vo. New Harmony, 1840.—*From the same.*

Descriptions of New Species of Quadrupeds inhabiting North America. By J. J. Audubon and the Rev. John Bachman, D.D.—*From the Authors, through Dr. Morton.*

Compendium of the Enumeration of the Inhabitants and Statistics of the United States, from the Returns of the Sixth Census. To which is added an Abstract of each preceding Census. Prepared at the Department of State. Folio. Washington, 1841.—*From the Hon. J. R. Ingersoll.*

Boletin Enciclopedico de la Sociedad Economica de Amigos del Pais. No. 7. 8vo. Valencia, 1842.—*From the Society.*

Iconografia della Fauna Italica di Carlo Luciano Bonaparte, Principe di Canino e Musignano. Parts XVI. to XXIX. inclusive. Folio. Rome, 1836–40.—*From the Author.*

Bulletin de la Société Impériale des Naturalistes de Moscou. Vol. XIV. Nos. 2, 3 & 4, and Vol. XV. No. 1. 8vo. Moscow, 1841–42.—*From the Society.*

Revue des Fossils du Gouvernment de Moscou. Par G. Fischer de Waldheim. 8vo. Moscow, 1842.—*From the Author.*

Journal de Pharmacie et de Chimie. Third Series. Vol. I. No. 6. 8vo. Paris, 1842.—*From the Editors.*

Journal of the Franklin Institute. Third Series. Vol. IV. No. 3. 8vo. Philadelphia, 1842.—*From Dr. Patterson.*

Prof. Bache read a paper, entitled "Observations on the Magnetic Dip, made in the United States in 1841, by J. N. Nicollet," which was referred to a Committee.

Mr. Lea exhibited specimens of rock masses, brought by Lieut. Rich of the U. S. Navy, from Payta in Peru, and from the Bay of Coquimbo in Chili.

Mr. Lea drew the attention of the Society particularly to the former, which was interesting chiefly from the fact of its tending to illustrate the theory of "existing causes." The rock from which this specimen was taken is a compact sandstone, composed of minute grains of quartz, cemented by carbonate of lime, and perforated by *Lithodomi* or Boring Mollusca, being identical with the species now inhabiting the neighbouring sea coast, and consisting of *Petricola solida*, *P. denticulata*, *Lithophagus dactylus*, &c. The included shells are in nearly a perfect state.

The elevation above the level of the sea from which this specimen was taken, as stated by Lieut. Rich, is nearly two hundred feet, which is remarkable, as the elevation of the coast by the earthquake of 1822, as mentioned by Mrs. Graham, was but a few feet, and that of 1835, as stated by Capt. Fitz Roy, being but about eight feet.

From the appearance of the specimen there can scarcely be a doubt but that it formed part of the shelving shore of the sea in a softer state, into which the Lithodomi made their requisite foramina.

The second specimen consists chiefly of a single valve of a large *Ostrea*, probably from the lower tertiary, and remarkable for its great size, its length being about twelve inches, and its breadth eight inches.

Mr. Kane announced the decease of Mr. Isaac Rand Jackson, a member of this Society, at Copenhagen, on the 27th of July, at the age of thirty-seven.

On motion of Mr. S. C. Walker, Mr. Kane was requested to prepare an obituary notice of the deceased.

Dr. Bache announced the decease of Baron Larrey, a member of this Society, on the 24th of July, 1842, aged seventy-six.

On motion of Dr. Patterson, Mr. Kuhn was appointed on the Committee of Finance, to fill the vacancy caused by the death of Mr. Nicklin.

Stated Meeting, October 7.

Present, twenty-nine members.

Mr. Du Ponceau, President, in the Chair.

Letters were read:—

From Mr. Petty Vaughan, dated London, 2d Sept. 1842, acknowledging the honour done him by his election as a member of this Society:—

From the Zoological Society of London, dated 2d July, 1842, and the Linnean Society of London, dated 18th July, 1842, severally acknowledging the reception of copies of the Transactions and Proceedings of this Society:—

From the Society of Antiquaries of London, dated 21st June, 1842, announcing the transmission of the twenty-ninth volume of the Archæologia:—

From Major Graham, dated Washington, 28th August, 1842, presenting a series of maps and charts, illustrating the demarcation of a portion of the boundary between the United States and Texas, and a chart of the entrance of the river Sabine:—

From Mr. William Cogswell, Corresponding Secretary of the Northern Academy of Arts and Sciences, of Hanover, N. H. dated 18th Dec. 1841, requesting the donation of the publications of this Society:—and

From Colonel Todd, American minister at St. Petersburg, dated 13th April, 1842, enclosing a letter received by him from his Excellency Count Cancrine, Minister of Finances of Russia, placing at Colonel Todd's disposal, two copies of Kupffer's work on weights and measures, one of which he presents to this Society.

On motion, the Society directed that a copy of the Proceed-

ings be regularly sent to the Academy of Arts and Sciences at Hanover, and that acknowledgments be made by the Secretary to Colonel Todd and Count Cancrine for the donation, received this evening, of Kupffer's work on Weights and Measures.

The following donations were announced:—

FOR THE LIBRARY.

Travaux de la Commission pour fixer les Mesures et les Poids de l'Empire de Russie. Rédigés par A. Th. Kupffer, Membre de cette Commission et Académicien. Two volumes, quarto, with a folio volume of Plates. St. Petersburg, 1841.—*From his Excellency Count Cancrine, Russian Minister of Finances, through Colonel Todd, American Minister at St. Petersburg.*

Archæologia, or Miscellaneous Tracts relating to Antiquity. Published by the Society of Antiquaries of London. Vol. XXIX. 4to. London, 1842.—*From the Society.*

The Transactions of the Linnean Society of London. Vol. XIX. Part I. 4to. London, 1842.—*From the Society.*

List of the Linnean Society. 1842.—*From the Society.*

Proceedings of the Linnean Society. No. 14.—*From the Society.*

Proceedings of the Geological Society of London. Nos. 77 to 83 inclusive.—*From the Society.*

Proceedings of the Royal Society. No. 54.—*From the Society.*

Astronomical and Magnetical and Meteorological Observations, made at the Royal Observatory, Greenwich, in the Year 1840: under the direction of George Biddell Airy, Esq. M.A., Astronomer Royal. 4to. London, 1842.—*From the Royal Society.*

Transactions of the Zoological Society of London. Vol. III. Part I. 4to. London, 1842.—*From the Society.*

Proceedings of the Zoological Society of London. Nos. 96 to 107 inclusive. 8vo. London, 1841.—*From the Society.*

Reports of the Council and Auditors of the Zoological Society of London, April 29, 1842. London, 1842.—*From the Society.*

Transactions of the Society instituted at London for the Encouragement of Arts, Manufactures and Commerce. Vol. LIII. Part II. 8vo. London, 1841.—*From the Society.*

Proceedings of the Academy of Natural Sciences of Philadelphia. Nos. 15 & 16. 8vo. Philadelphia, 1842.—*From the Academy.*

Ueber die Lais, Sequenzen und Leiche. Ein Beitrag zur Geschichte der Rhythmischen formen und Singweisen der Volkslieder und

der Volksmässigen Kirchen-und Kunstlieder im Mittelalter. Von Ferdinand Wolf. 8vo. Heidelberg, 1841.—*From the Author.*

Notice sur l'Eurypterus de Podolie et le Chirotherium de Livonie, par G. Fischer de Waldheim, Dr. en Philosophie, etc. 4to. Moscow, 1839.—*From the Author.*

The American Journal of the Medical Sciences. Edited by Isaac Hays, M.D. New Series. No. 8. For October, 1842. 8vo. Philadelphia, 1842.—*From the Editor.*

Académie Royale des Sciences. Rapport sur un Mémoire de M. Costa, etc. 4to. Paris, 1826.—*From Mr. D. B. Warden.*

Académie Royale des Sciences. Rapport sur un Mémoire de M. Sérullas, etc. 4to. Paris, 1829.—*From the same.*

Académie Royale des Sciences. Exposé des Recherches pour déterminer les Forces élastiques de la Vapeur d'Eau à de hautes Températures. 4to. Paris, 1830.—*From the same.*

Académie Royale des Sciences. Rapport sur un Mémoire de M. le Baron de Morogues, etc. 4to. Paris, 1832.—*From the same.*

Comparison des Formes crystallines de la Strontiane carbonatée avec celles de l'Arragonite. Par M. Haüy. 4to. Paris.—*From the same.*

Nouvelles Observations sur la Faculté conservatrice de l'Électricité acquise à l'aide du Frottement. Par M. Haüy. 4to. Paris.—*From the same.*

Observations sur la Simplicité des Lois auxquelles est soumise la structure des Cristaux. Par M. Haüy. Paris.—*From the same.*

Description d'une Nouvelle Variété d'Amphibole. Par M. Haüy. 4to. Paris.—*From the same.*

Sur les Cymophanes des États-Unis. Par M. Haüy. Paris.—*From the same.*

Sur l'Usage des Caractères physiques des Minéraux, pour la distinction des Pierres précieuses qui ont été taillées. Par M. Haûy. 4to. Paris —*From the same.*

Institut Royal de France. Annuaire, 1842. 12mo. Paris, 1842. *From the same.*

Expédition au Pôle Antarctique des Corvettes l'Astrolabe et la Zélée, sous le Commandement de M. Dumont d'Urville. 8vo. Paris, 1840.—*From the same.*

Rapport sur les Travaux de la Société Royale et Centrale d'Agriculture, depuis sa Séance publique de 26 Avril, 1841. Par M. Soulange Bodin. 8vo.—*From the same.*

De la Plantation du Melèze (Pinus larix), d'après des Observations faites en Ecosse. 8vo.—*From the same.*

Conseils aux Nouveaux Éducateurs de Vers à Soie. Par M. Frédéric de Boullenois. 8vo. Paris, 1842.—*From the same.*

Rapport sur une Proposition faite au Gouvernement par M. de Lasteyrie. Par le Secrétaire perpétuel, G. Cuvier. 1er Février, 1813. Folio.—*From the same.*

A lithographic plate, entitled "Mosaïque découverte le 24 Octobre, 1831, dans une Maison de Pompéi, dite la Maison du Faune."—*From the same.*

Map of the River Sabine from Logan's Ferry to 32d degree of North Latitude, showing the Boundary between the United States of America and the Republic of Texas between said Points.—*From Major Graham, U. S. Topog. Engineers.*

Part of the Boundary between the United States and Texas, from Sabine River, northward, to the 36th mile Mound.—*From the same.*

Part of the Boundary between the United States and Texas, North of Sabine River, from the 39th to the 72d mile Mound.—*From the same.*

Part of the Boundary between the United States and Texas, North of Sabine River, from the 72d mile Mound to Red River.—*From the same.*

Sabine Pass, and Mouth of the River Sabine in the Sea. Surveyed, under the direction of Major J. D. Graham, U. S. Topog. Engineers, by Lieut. T. J. Lee, Topog. Engineers, and Capt. P. J. Pillans, Texan Army.—*From the same.*

Map of the River Sabine, from its Mouth on the Gulf of Mexico, in the Sea, to Logan's Ferry, in Latitude 31° 58′ 24″ north. Showing the Boundary between the United States and the Republic of Texas.—*From the same.*

Mr. Kane, pursuant to the order of the Society at its last meeting, presented an obituary notice of the Hon. Isaac Rand Jackson.

Mr. Jackson was born at Newburyport, Massachusetts, where his family had resided for many years. After receiving an education in the public schools of Massachusetts, to which he added largely by assiduous private study, he engaged for a short time in merchandise. His health, however, led him to visit Europe soon after he had reached manhood, and he spent some years there in the cultivation of the refined tastes by which he was afterwards distinguished. On his return, he studied law under Chief Justice Cranch of the District of Co-

lumbia, and was admitted to the bar of Washington and that of Philadelphia.

But the law was for him an accomplishment, rather than a profession. He devoted himself more fully to general science and elegant literature, and found congenial relaxation in the study of the arts. An ample fortune facilitated these pursuits. He surrounded himself with choice pictures and statuary, a fine cabinet of medals and coins, a collection of minerals more extensive perhaps in the number of specimens than any other in the United States, and an exceedingly valuable library.

He was not, however, a mere collector. His books, though remarkable some of them for their antiquity and rarity, were not things for show. To the standards of English and continental literature, he added all the latest productions of value as they issued from the press: he received these regularly, and sifted them himself before assigning them a place on his shelves. The descriptive catalogue of his minerals, which includes more than 12,000 specimens, classified upon the basis of Cleaveland's system, each compared with the original type and its characteristics indicated, is a monument of his scientific labour. The preparation of it engaged his leisure, between midnight and two o'clock, for several years.

Indeed, all his habits showed the man of regulated industry. Almost engrossed occasionally by the cares of his estate during the day,—sharing zealously and effectively in the political discussions of the times,—mastering successively the French, Italian, Spanish, and German languages,—and keeping himself in the advance among the students of natural science,—he had always his hours of leisure for an enlarged correspondence, and for ample hospitality.

He became a member of the Society in April, 1841. He had shortly before accepted from General Harrison the post of Chargé d'Affaires at Copenhagen, and in August of that year he sailed for Denmark. He had scarcely become domiciliated in his diplomatic residence, and was just renewing some researches which he had begun at home into the antiquities of the North, when death met him on the 27th of July, 1842, at the early age of thirty-seven.

Dr. Patterson read a paper on the "Integration of Irrational Functions, by Pike Powers," which was referred to a Committee.

A paper, consisting of extracts from a mathematical commonplace book, was read, and referred to a Committee.

Dr. Hare communicated to the Society, a summary of his objections to the arguments in favour of the existence, in the amphide salts, of compound radicals analogous to cyanogen.

Dr. Hare stated, that the success which had been conceived to attend the inferences lately made, respecting the existence of compound radicals in various interesting organic substances, had led some distinguished chemists to suppose that the salts heretofore believed to consist of acids and bases, might consist of a compound halogen body or "salt radical," with a metal or with hydrogen.

Having given to the facts and arguments advanced in favour of this new doctrine the most sedulous consideration, Dr. Hare declared himself to have arrived at the conviction that it was susceptible of being refuted.

Accordingly, he had prepared an essay which it was hoped would be found to justify the view of the question which he had taken. He did not, however, deem it proper to take up the time of the Society by entering into the subject fully in a verbal communication; he would only submit a summary of the opinions which he hoped to justify in the essay which he intended to publish.

(*a*) The community of effect, as respects the extrication of hydrogen by contact of certain metals with aqueous solutions of sulphuric and chlorohydric acid, is not an adequate ground for an inferred analogy of composition; since it must inevitably arise that any radical will, from any compound, displace any other radical, when the forces favouring its substitution preponderate over the quiescent affinities:—

(*b*) But if, nevertheless, it be held that the evolution of hydrogen from any combination, by contact with a metal, is a sufficient proof of the existence of a halogen* body, simple or compound, in the combination, the evolution of hydrogen from water, by the contact with any metal of the alkalies, must prove oxygen to be a halogen body; also the evolution of hydrogen from sulphydric, selenhydric, or tellurhydric acids, by similar means, would justify an inference that sulphur, selenium and tellurium, as well as oxygen, belong to the halogen or salt radical class:—

(*c*) The amphigen bodies being thus proved to belong to the halogen class, oxides, sulphides, selenides, and tellurides, would be haloid salts, and their compounds double salts, instead of consisting of a compound radical and a metal:—

* The epithet halogen is applied to bodies whose binary compounds with metals are deemed salts, and which are consequently called haloid salts.

(*d*) The argument in favour of similarity of composition in the haloid and amphide salts,* founded on a limited resemblance of properties in some instances, is more than counterbalanced by the extreme dissimilitude in many others:—

(*e*) As, in either class, almost every property may be found which is observed in any chemical compound, the existence of a similitude, in some cases, might be naturally expected:—

(*f*) As it is evident that many salts, perfectly analogous in composition, are extremely dissimilar in properties, it is not reasonable to consider resemblance in properties, as a proof of analogy in composition:—

(*g*) No line of distinction, as respects either properties or composition, can be drawn between the binary compounds of the amphigen and halogen bodies, which justifies that separate classification which the doctrine requires; so that it must be untenable as respects the one or be extended to the other:—

(*h*) The great diversity, both as respects properties and composition of the bodies called salts, rendering it impossible to define the meaning of the word, any attempt to vary the language and theory of Chemistry, in reference to the idea of a salt, must be extremely pernicious:—

(*i*) There is at least as much mystery in the fact that the addition of an atom of oxygen to an oxacid, should confer an affinity for a simple radical, as that the addition of an atom of this element to such a radical, should create an affinity between it and an oxacid:—

(*j*) If one atom of oxygen confer upon the base into which it enters, the power to combine with one atom of acid, it is quite consistent that the affinity should be augmented, proportionably, by a further accession of oxygen:—

(*k*) It were quite as anomalous, mysterious, and improbable, that there should be three oxyphosphions, severally requiring for saturation one, two, and three atoms of hydrogen, as that three isomeric states of phosphoric acid should exist, requiring as many different equivalents of basic water:—

(*l*) The attributes of acidity alleged to be due altogether to the presence of basic water, are not seen in hydrated acids, when holding water in that form only; nor in such as are, like the oily acids, inca-

* An amphide salt is one consisting of an acid and a base, each containing an amphigen body, either oxygen, sulphur, selenium, or tellurium, as its electro-negative ingredient.

pable of uniting with water as a solvent. Further, these attributes are admitted to belong to salts which, not holding water as a base, cannot be hydrurets or hydracids of any salt radical: and while such attributes are found in compounds which, like chromic and carbonic acid, cannot be considered as hydrurets, they do not exist in all that merit this appellation, as is evident in the cases of prussic acid and oil of bitter almonds:—

(*m*) It seems to have escaped attention, that if SO^4 be the oxysulphion of sulphates, SO^3, anhydrous sulphuric acid, must be the oxysulphion of the sulphites; and that there must, in the hyposulphites and hyposulphates, be two other oxysulphions!—

(*n*) The electrolytic experiments of Daniell have been erroneously interpreted; since the electrolysis of the base of sulphate of soda would so cause the separation of sodium and oxygen, that the oxygen would be attracted to the anode, the hydrogen and soda being *indirectly* evolved by the reaction of sodium with water; while the acid deprived of its alkaline base, would be found at the anode in combination with basic water, without having been made to act in the capacity of an anion:—

(*o*) The copper, in the case of a solution of the sulphate of this metal and a solution of potash, separated by a membrane, would, by electrolyzation, be evolved by the same process as sodium, so long as there should be copper to perform the office of a cathion; and when there should no longer be any copper to act in this capacity, the metal of the alkali, or hydrogen of water, on the other side of the membrane, would act as a cathion; the oxygen acting as an anion from one electrode to the other, first to the copper, and then to the potassium:—

(*p*) The allegation that the copper was deposited from the want of an anion (oxysulphion) to combine with, is manifestly an error; since, had there been no anion, there could have been no discharge, as alleged, to hydrogen as a cathion, nor any electrolysis:—

(*q*) The hydrated oxide precipitated on the membrane came from the reaction of the alkali with the sulphate of copper; the precipitated oxide of this metal from the oxygen of the soda acting as an anion; and the deposite of metallic copper from the solutions performing, feebly, the part of electrodes, while themselves the subjects of electrolyzation:—

(*r*) The so called principles of Liebig,* by which his theory of

* Traité de Chimie Organique, tom. 1, page 7.

organic acids is preceded, are mainly an inversion of the truth; since they make the capacity of saturation of hydrated acids dependent on the quantity of hydrogen in their basic water, instead of making both the quantity of water, and, of course, the quantity of hydrogen therein, depend on their capacity:—

(*s*) All that is truly said of hydrogen would be equally true of any other radical; while the language employed, would lead to the belief that there is a peculiar association between capacity of saturation, and the presence of hydrogen.

Prof. Bache drew the attention of the Society to the necessity of providing means for continuing the observations now making under the direction of the Society at the Magnetic Observatory, or of closing the Observatory: whereupon, on motion of Dr. Patterson, a special Committee was appointed, to report in regard to providing means for the continuation of the observations. Committee, Dr. Chapman, Dr. Patterson, Dr. Wood, Mr. Fraley, and Mr. Kane.

On motion of Mr. F. Peale, permission was granted to Mr. Justice, to have casts made from certain medals in the cabinet of the Society, under the direction of the Curators.

Stated Meeting, Oct. 21.

Present, thirty-nine members.

Mr. Du Ponceau, President, in the Chair.

Letters were read:—

From Fletcher Webster, Esq. Acting Secretary of State, dated Washington, 7th Oct. 1842, announcing the transmission to the Society of a number of volumes of Public Documents:—

From the Secretary of the Imperial Society of Naturalists of Moscow, dated 13th July, 1842, announcing that the Bulletin of the Moscow Society for 1842, had been forwarded to this Society:—

From the Secretary of the Botanical Society of London, dated 1st July, 1842, and the Secretary of the Royal Geographical Society of London, dated 12th Jan. 1842, severally ac-

knowledging the receipt of numbers of the Society's Proceedings:—and

From Mr. Jacob Snider, Jr. dated Philadelphia, 21st Oct. 1842, presenting to the Society a bust of the late John Vaughan, Esq.

On motion of Mr. Kane, it was resolved that the donation of Mr. Snider be accepted, and that the bust of Mr. Vaughan be placed as desired in Mr. Snider's letter.

The following donations were announced:—

FOR THE LIBRARY.

The United States' Almanac, or Complete Ephemeris, for the Year 1843. By John Downes. 8vo. Philadelphia.—*From the Author.*

Journal of the Franklin Institute of the State of Pennsylvania. Third Series. Vol. IV. No. 4. 8vo. Philadelphia, 1842.—*From Dr. Patterson.*

Bulletin de la Société Impériale des Naturalistes de Moscou. Vol. XV. No. 2. 8vo. Moscow, 1842.—*From the Society.*

Catalogus Coleopterorum in Sibiria Orientali a Cel. Gregorio Silide Karelin collectorum, auctore G. Fischer de Waldheim. 8vo. Moscow, 1842.—*From the Author.*

Executive Documents, Second Session, Twenty-sixth Congress. Vols. I. to VI. inclusive. 8vo. Washington, 1840–41.—*From the Department of State.*

Reports of Committees, Second Session, Twenty-sixth Congress. 8vo. 1840–41.—*From the same.*

House Journal, Second Session, Twenty-sixth Congress. 8vo. 1840–41.—*From the same.*

Index to the Executive Documents and Reports of Committees of the House of Representatives, commencing Dec. 1831, and ending March, 1839. 8vo.—*From the same.*

House Journal, First Session, Twenty-seventh Congress. 8vo. 1841.—*From the same.*

Senate Documents, Second Session, Twenty-sixth Congress. Vols. I. to V. inclusive. 8vo. 1840–41.—*From the same.*

Senate Documents, First Session, Twenty-seventh Congress. 8vo. 1841.—*From the same.*

Senate Journal, Second Session, Twenty-sixth Congress. 8vo. 1840–41.—*From the same.*

Senate Journal, First Session, Twenty-seventh Congress. 8vo. 1841.—*From the same.*

Executive Documents, and Reports of Committees, First Session, Twenty-seventh Congress. 8vo. 1841.—*From the same.*

Resolutions, Laws and Ordinances, relating to the Pay, Half-pay, Commutation of Half-pay, Bounty Lands, and other Promises made by Congress to the Officers and Soldiers of the Revolution, &c. Twenty volumes. 8vo. 1838.—*From the same.*

Report from the Secretary of the Navy, communicating a Report on the Second Invention of Thomas S. Easton, for preventing Explosions of Steam-boilers. 8vo. 1842.—*From the same.*

Transactions of the Natural History Society of Northumberland, Durham, and Newcastle upon Tyne. Vols. I. & II. 4to. Newcastle, 1831—1838.—*From the Society.*

Account of the Magnetical Observatory of Dublin, and of the Instruments and Methods of Observation employed there. By the Rev. Humphrey Lloyd, D.D. 4to. Dublin, 1842.—*From the Author.*

The Journal of the Royal Asiatic Society of Great Britain and Ireland. No. 13. 8vo. London, 1842.—*From the Society.*

Proceedings of the Geological Society of London. Vol. III. Part II. Nos. 84, 85 & 86. 8vo. London, 1841–42.—*From the Society.*

Poésies Choisies de Jean-Simon Chaudron, suivies de l'Oraison Funèbre de Washington, par le même Auteur. 8vo. Paris, 1841. *From Mr. Du Ponceau.*

The paper, entitled "Extracts from a Mathematical Common Place Book," read at the last meeting, was, with the consent of the Society, withdrawn by the author.

Mr. Lea read a continuation of his paper on new fresh water and land shells, which was referred to a Committee.

This paper contains the following species:—

Unio Foremanianus. Testâ triangulari, compressâ, inæquilaterali, posticè angulatâ, ad latera planulatâ; valvulis crassis; natibus prominentibus; epidermide luteâ, valdè radiatâ; dentibus cardinalibus crassis; lateralibus crassis rectisque; margaritâ albâ. *Hab.* Coosa River, Ala.—*Dr. Brumby.*

Unio Haleianus. Testâ ellipticâ, subinflatâ, inæquilaterali; valvulis subtenuibus; natibus prominulis, ad apicem undulatâ; epidermide tenebroso-fuscâ, striatâ; dentibus cardinalibus magnis, compressis; lateralibus longis subcurvisque; margaritâ albâ et iridescente. *Hab.* Mississippi River, 30 miles above New Orleans. *Josiah Hale, M.D.*

Unio Dariensis. Testâ oblongâ, subinflatâ, inæquilaterali, posticè perangulatâ, ad latera planulatâ, valvulis subcrassis, natibus prominulis; epidermide luteo-fuscâ; dentibus cardinalibus compressis; lateralibus longissimis lamellatisque; margaritâ albâ. *Hab.* Near Darien, Georgia. *J. H. Couper, Esq.*

Anodonta Dunlapiana. Testâ ellipticâ, inflatâ, subcylindraceâ, transversè vittatâ; valvulis tenuibus; natibus prominulis, undulatis; epidermide nitidâ, luteolâ, obsolete radiatâ; margaritâ albâ et iridescente. *Hab.* South Carolina.—*Mrs. Dunlap.*

Dr. Hare laid on the table some copies of an essay published in Silliman's Journal for July, entitled "Additional Objections to Redfield's Theory of Storms," for the use of such members as might take an interest in meteorological discussions.

In addition to the errors previously enumerated as existing in the opinions and allegations, advanced in favour of that hypothesis, he had, in the essay now submitted, adverted to the following:—

Attributing winds to the rotary or orbitual motion of the earth, when by those forces no corresponding currents are produced in the ocean.

Alleging that, by a conflict with an island, or concentration by cliffs, a trade wind could be so accelerated and deflected, as to whirl with the fury of a hurricane.

Supposing that, if a whirlwind could be so induced, it could endure and could even receive an accession of force from a conflict with extraneous bodies; when, owing to the centrifugal force consequent to the gyration, the momentum must be rapidly communicated to the surrounding fluid, and thus be dissipated in a quantity of matter, increasing with the square of the distance from the centre.

The inconsistency of the characteristics of whirlwind storms, as made out by certain alleged "*reliable facts and observations,*" of Mr. Redfield; such storms being represented as heaping up the air on the border of the centrifugal force, while, at the same time, carrying it, and other bodies, towards the centre, to be discharged at "*one extremity of the axis of rotation.*"

The contradiction in representing the barometric column as sinking when first exposed to the advanced portion of a whirlwind, and rising when under the rear portion; when it is admitted that, by the centrifugal force, an aërial accumulation must take place on all sides towards the border.

The inconsistency of representing the diameter of the most violent zone in storms, as usually much exceeding a hundred miles, the storm advancing twenty-seven miles per hour; and yet that an ob-

server, over whom the centre should pass, after exposure to the greatest violence of the whirl on one side, could be *suddenly* exposed to an equally violent but contrary wind on the opposite side.

The discordancy of the whirlwind theory (agreeably to which a storm, travelling towards the *north-west* and *whirling* to the *left*, must have its greatest velocity in a south-easter on the north-eastern limb, where the tangential velocity coincides with the progressive motion), with the fact stated by Edwards, and admitted by Redfield, that on the limb alluded to, in the storms alleged so to move, there is the least violence.

The obvious consequence, that if our north-eastern gales be due to a whirlwind, moving along the coast of the United States at the rate of twenty-seven miles nearly per hour, whirling to the left, the gyratory velocity on the south-eastern limb must be more than fifty miles per hour greater than on the north-western limb; so that a much more violent gale from the south-west, at sea, must be simultaneous with the prevalence of every north-eastern gale along the coast; all of which is contrary to experience.

The palpable inconsistency of representing tornadoes as generated by the conflict of winds, arising from the earth's motion, with islands, and yet as ensuing in a calm, where there are no active currents to meet each other.*

To this list of errors, the following, since detected, might be subjoined:—

In opposition to the "*long cherished theory of calorific rarefaction*," entertained by the modern meteorological school, Mr. Redfield ascribes all winds to a rotative movement, arising from rotary or orbitual motion of the earth, and conflicts between trade winds and islands, and yet denies that he has advanced any theory of storms upon assumed scientific principles.

He repeats that the general winds would be more uniform, brisk,

* If tornadoes originate in calms, where there are "*no currents to meet each other*," and if they be attended by vertical currents about the axis, this must of necessity be productive of centripetal currents, which will probably gyrate from their obliquity. But what other cause can be productive of the upward current under such circumstances, if it be not an inferior pressure over a central space?

Redfield's account of whirlwinds excited by fire demonstrates, that a cause producing an upward current in the atmosphere, may, under favourable circumstances, be productive of tornadoes and concomitant electrical discharges. See Silliman's Journal, for 1839, Vol. XXXVI. page 50.

and constant, than at present, were the temperature uniform all over the globe, and yet denies that he represents the agency of heat as *unnecessary* to the existence of winds.

As if affording support to his hypothesis, he continues his effort to show that there has been gyration during certain tornadoes, after it has been demonstrated that such gyration, being attended, *as he has admitted*, by an upward current about the axis, and an acceleration of velocity towards the centre of motion, is irreconcilable with whirlwinds arising from the causes to which he has referred, and *which have been inconsistently admitted by him to be productive of a centrifugal force, determining the air towards the circumference.*

Founding an accusation of error, upon a mistake of his own, in alleging that, when a storm travels from south-west to north-east, whirling to the left, the progressive motion will not conspire with that of the whirl on the south-eastern limb, so as to be productive of a south-wester of pre-eminent fury: whence this inference, that Mr. Redfield cannot perceive one of the most palpable and inevitable consequences of his own doctrine, even after it has been pointed out to him.*

Subsequently to the preparation of his second essay respecting the errors of Redfield, Dr. Hare had found, in Dove's essay on the law of storms, other errors, of which he would now give a sketch.

Treating it as sufficient to show a cause of gyration in a wind blowing towards the equator, without assigning any cause for the peculiar violence of the wind, which, being thus made to whirl, is converted from a moderate trade wind into a furious hurricane.

Not perceiving that whatever bends the wind from a straight course, must cause a loss of some portion of its velocity; so that gyration must have the inverse effect of contributing to the unexplained accession of violence which accompanies the transformation alluded to: and further, that a travelling storm, as every whirlwind is represented to be, cannot be sustained unless the causes of violence travel with it; since any momentum, *locally* acquired, must soon be expended; and

* Agreeably to the observations collected by Loomis, the storms, in which the well known sudden change from south-west to north-west occurs, travel from north-west to south-east. But a change from the latter to the former direction can only take place in a whirlwind in travelling from south-west to north-east. Besides, as such storms have to cross the Alleghany mountains, is it not inconceivable that they should whirl? See Transactions, A. P. S. Vol. VII.

Can any mass of air be imagined to rotate, while a range of mountains is so situated as to cut it nearly in twain?

the more rapidly, on account of the centrifugal force causing a collision with inert portions of the atmosphere beyond the zone, at which the generating forces may have been applied.

The centripetal theory assumes that an ascending column about the centre of a storm, causes an afflux of wind from opposite quarters. Professor Dove alleges that such winds must neutralize each other, their intensity lessening more and more, as they approach their place of meeting. This shows that he does not understand the theory which he has undertaken to refute; since it must be quite evident, that, in rushing towards an ascending column, the velocity must become greater as the space within which the affluent air has to move becomes less.

It is also inferred by this negligent reasoner, that the sudden change of wind from one direction to another directly opposite, for which hurricanes are notorious, and in proof of which he adduces additional evidence, is inconsistent with the centripetal theory, upon the erroneous inference above noticed; when this suddenness of change has been shown to be irreconcilable with the idea that hurricanes are whirlwinds. In that case the wind would blow comparatively with little force within a large central area, which, at the rate of travelling admitted by him, would require several hours to pass over an observer, so situated as to be successively exposed to opposite winds.

That an upward current, having a base of 10,000 feet, or two miles nearly, would require more wind to supply it (if of equal velocity) than 400 of the largest tornadoes ever known to take place in the United States. It was believed that no tornado had been observed to have a focal area over 500 feet,* which would be only one-twentieth of the diameter above assumed, and of course the areas would be as 400 to 1.

According to Professor Dove, storms travel at the rate of thirty miles an hour. At this rate a focal area of 10,000 feet would require less than two minutes to pass over an observer, so as to subject him to winds blowing directly opposite to each other.

* The space within which the water rose, during the passage of a tornado over the river near Providence, in August 1838, was estimated by Mr. Allen at 300 feet. Of course, a focal area of 500 feet would have been productive of a tornado nearly three times as large; or as the square of 5 to that of 3, or as 25 to 9. See Silliman's Journal for 1840, Vol. XXXVIII. p. 77, or Transactions, A. P. S. Vol. VI.

It is taken for granted that the space, within which the water rose, was the focal area, or base of the ascending column.

Dr. Hare had prepared a communication for the American Journal of Science, in which he hoped to justify his summary statement of Dove's errors.

Prof. Henry communicated, orally, an extension of the experiments, which he had previously brought before the Society, on electro-dynamic induction. He had succeeded in magnetizing needles by the secondary current in a wire more than two hundred and twenty feet distant from the wire through which the primary current was passing, excited by a single spark from an electrical machine.

Mr. Lea called the attention of the Society to two specimens of coal, taken from the large anthracite coal bed in the Pine Grove district.

One of the specimens was remarkable for its regular rhombic form, in which all the angles were 70° and 110°, the cleavage of each plane being nearly perfect. The other was part of a large specimen of carbon, scarcely changed from its condition as charcoal, the loose fibrous structure being nearly perfect, and the whole having very thin laminæ of pure anthracite, parallel with the fibre.

A portion only (2 or 3 feet) of this large bed, the dip of which is about 35°, presented the oblique cleavage, preserving that character throughout as far as could be observed.

Mr. Lea then made some observations on the disturbed condition of the whole of the southern coal field, and read a portion of a letter from the Athenæum, addressed by Mr. Lyell to Dr. Fitton, where he states that the conversion from the bituminous to the anthracite condition is "most complete where the beds have been most disturbed."

Mr. Lea did not think this was the case throughout this coal field; for Mr. Lyell seemed to have overlooked the fact, as shown in the sections of Mr. Taylor's reports on that part which passes through the county of Dauphin, and known generally to our geologists, that this, like the coal field of South Wales, insensibly graduates into bituminous coal. Such is the fact as we proceed westward in the southern coal field of Pennsylvania, the bitumen being yielded up in the more eastern part, as stated by Mr. Taylor, Prof. Silliman, and other geologists.

It is well known that the conglomerates and coal beds of Sharp Mountain (the southern border of this coal field) are nearly vertical at Tamaqua, Pottsville, Pinegrove, Goldmine Gap, Rauch Gap, Yellow Spring Gap, and Rattling Run Gap; but there is a great differ-

ence in the debituminization in these different districts; the eastern group varying from 5 to 7 per cent. in the proportion of volatile matter, while the western group has a much larger proportion, and varies from 9 to 17 per cent., differing but 1 or 2 per cent. from that of Blossburg, Queen's Run, Ralston and Cumberland, Md.; all these being on the eastern part of the great western coal field.

The attention of the Society having been called by the Librarian to the state of the manuscripts in the Library, it was, on motion of Mr. Kane, resolved that a Committee be appointed to consider the present condition of the manuscripts in the possession or custody of the Society, and that they report whether any and what action may be proper for their secure preservation, and for facilitating their usefulness. Committee, Mr. Ord, Mr. Kane and Mr. Frazer.

The following gentlemen were elected members of the Society:—

Rev. George Peacock, F.R.S., of Cambridge, England.

J. I. Clark Hare, Esq., of Philadelphia.

Prof. Benjamin Peirce, of Harvard University.